

The young mother has suffered from severe burns. This could cause many problems in the body, and is potentially life threatening.

Firstly as her burn takes away the skin, she loses her non permeable barrier to keep fluid within her body. Combined with the tremendous heat from the oil and localized vasodilation caused by NO & CO_2 in the endothelium will cause excess fluid loss from her body.

The vasodilation will also cause oedema which will ~~and~~ and both oedema and fluid loss will contribute to hypovolaemia.

Hypovolaemia is the drop in fluid levels in your vessels and this causes further damage to the body. It will firstly ~~concentrate the amount of~~

stimulate the baroreceptors in the carotid sinus and aortic arch ~~to and~~ and consequently cause tachycardia ^{and} stronger stroke volume and ~~stimulate~~ to try to compensate. Similarly the hypothalamus ^(osmoreceptors) will detect the hypernatraemia

and secrete ADH, the ~~for~~ stretch receptors in the atrium and Juxta-glomerular junction will detect the fluid loss and secrete less ANP, and more RA renin. These mechanisms all compensate for the hypovolaemia

but because the ~~so~~ fluid loss will be too great, it will be unlikely to

make a life saving change. Secondly, due to the loss of fluid, there will

be an increase in the haemocoentration. This makes the blood more thick

and increases the risk of thrombosis & and clots. The doctors will probably

also include a low molecular weight heparin in their treatment plan to prophylactically prevent further tissue damage caused by clots. ~~Finally~~ Thirdly,

I touched on the aspect of hypernatraemia & hypotonaemia earlier, but this

can also determine the situation. The loss of fluid will cause a relative increase in $[Na^+]$ and $[K^+]$. This causes thirst, sense of unease, confusion and in severe cases coma and sudden cardiac arrest (due to

increased resting potential due to K^+). The kidneys will try to secrete the excess salts out but due to the poor perfusion in hypovolaemia, this

will be very inefficient. Finally and maybe most importantly, due to the poor perfusion caused by hypovolaemia, the cells in the body will not

get sufficient O_2 . There will be an increase in ~~lact~~ anaerobic respiration,

causing an enormous influx of lactic acid. Eventually the respiratory

- ✓ Compensation of will not be sufficient and cause acidosis. The
- ✓ increase in $[K^+]$ will also contribute to the acidosis indirectly.
- ✓ Acidosis is probably very dangerous and cause cell ~~depr~~ disruption, tissue lysis ~~and~~, kidney failure and liver failure.
- ✓ All of these fluid problems can be treated with adequate fluid replacement, appropriate dressing on the skin to act on the skin, and sufficient O_2 supply. The fluid should probably be colloids to start off with to try to keep the fluid in the vessels. The volume ~~the~~ amount should be calculated by $= 4 \times \text{Body Surface Area burnt} \times \text{weight (kg)} / \text{day}$.
- ✓ The half of this should be given in the first 8hrs, but care should be taken to infuse slowly as sudden fluid ~~depr~~ infusion can quickly cause hypernatremia which can be deadly. The fluid levels should be monitored regularly and appropriate salts should be given to balance out the "fluid overload" if necessary. The O_2 supply should be very high (80%) and attached to her with a tight fit ~~for~~ mask.
- ✓ If the burn has covered her face, intubation or tracheostomy may be necessary.

Ventilator

- ✓ She has lost her first barrier against microorganisms. Her skin.
- ✓ This combined with her immunocompromised state of being in hypovolaemic shock and hypothermia (and possibly being in hospital) will contribute to the likely chance that she will get infected.
- ✓ A likely organism would be Staph. Aureus because it ~~let~~ lives on the skin and can also produce biofilm so it can enter through lines and tubes inserted into the mother. Her liver will be hypoperfused and won't be able to produce as many antimicrobial proteins which would help the innate immune system. Also her skin exposed, moist, warm and full of nutrients, it is an excellent culture ~~of~~ for bacteria to breed on. Staph. Aureus can ~~pot~~ produce toxins and superantigens which will cause endothelial damage, resulting in vasodilation and increase in tissue factors. This will further ~~damage~~ ~~dehydrate~~ ~~dehydrate~~ worsen her hypovolaemic state and thrombotic state. The infection will also cause pyrexia, contributing to the hypothermia.

and acidosis leading to the problems discussed earlier. If her HR heart rate increases, with rose white cell count and temperature, she can suffer from Sepsis. Combined with the hypotension, she can also suffer from septic shock a few days after the event. Prophylactic antibiotics (broad spectrum) should be administered to prevent this. When prescribing care should be taken to make sure she is not allergic to any drugs and that she is not taking any medication which may cause interactions. For example phenytoin (can interact with erythromycin) or the warfarin.

When a patient is ill, especially burnt, their BMR increases to nearly double. From the stress, medication and ~~hospital stay~~ ^{the burns/burns} she is unlikely to eat ~~well~~ eat sufficiently. She should be fed with an NG tube or with sip feeds and be monitored for any weight loss throughout her hospital stay. ~~As due to~~ The increase in BMR is due to the mass influx in cytokines from the burn and possible infection cause causing high catabolic state. She will also be ~~se~~ secreting lots of adrenaline, cortisol and noradrenaline with inhibition of insulin in this state and thus continuously catabolizing. This causes muscle and fat breakdown leading to malnutrition. 10% loss of lean body mass can cause further immunosuppression. Also it is strongly correlated with poor prognosis. Starvation can cause ketoacidosis and further worsen the acidotic state that she is in.

She should also get adequate care for the pain. Opiates should be administered. Also post traumatic distress syndrome with her and her daughter should be considered for a better prognosis. Better education for her ~~and~~ the whole family will prevent these events. Also plastic/reconstructive surgery should be considered for cosmetic and ~~of~~ quality of life issues.

Outstanding, Excellent, well integrated